REMARKS

The Office Action mailed on April 14, 2005 has been carefully considered and the Examiner's remarks are appreciated. Claims 1-46 were originally in the application. In affirmation of the telephonic provisional election made on April 8, 2005 in response to a restriction requirement, Applicants elect Group I, claims 1-19 and 45-46 for prosecution, and claims 20-44 are withdrawn. In addition, claims 2 and 16 have been canceled, and claims 1, 12, 14, and 45 have been amended. Therefore claims 1, 3-15, and 17-19 are presented here for examination. Applicant respectfully request reconsideration of the rejection of claims 1, 3-15, and 17-19 in view of the amendments and the following remarks. No new matter has been added, with the amendments supported by the Specification, claims, and the drawings.

Discussion of the Rejections Under 35 USC §102

The Examiner rejected claims 1-17, 45 and 46 under 35 USC §§102(e) as being anticipated by U.S. Pat No. 6,685,810 to Noca et al ("Noca"). As mentioned above claims 2 and 16 have been canceled.

Applicant has amended independent claims 1 and 45 to clarify the distinctions from the prior art. In particular, claims 1 and 45 have each been amended to include at least some of the limitations of claims 2 and 16, now canceled. For example, claim 1 has been amended as follows:

> *"an elastically compressed carbon nanotube mesh comprising a plurality of intertwined free-standing carbon nanotubes fixedly attached within and randomly extending from the surface of said channel to form irregularly sized mesh pores between the intertwined nanotubes for separating, concentrating, and/or filtering molecules flowed therethrough;*

and a cover layer sealably capping said microfluidic channel to thereby pack the carbon nanotube mesh in the microfluidic channel."

The amendment shown above clarifies at least two points distinct from the prior art.

First, the language *"...to form irregularly sized mesh pores between the intertwined nanotubes..."* clearly requires that the nanotubes are intertwined with each other, and not vertically aligned, so as to form the irregular sized mesh pores used for separating, filtering, and/or concentrating. While the Examiner cited column 5, lines 20-27 in Noca as disclosing pore size, Applicants respectfully submit that the term "pore size" in Noca is actually the horizontal spacing of the vertically aligned columns (see col. 6, line 39) and is not the irregularly sized mesh pores of the present invention. This is a key difference since the apparatus and fabrication process taught in Noca inherently creates vertically aligned nanotubes using templates, not by freely growing the nanotubes in free space. Thus, despite the Examiner's assertion that Noca teaches *"any size, shape and spacing..."* this cannot include creating intertwined, randomly extending nanotubes.

Secondly, the "elastically compressed" configuration of the mesh is produced by packing the mesh into the channel via the cover layer. This is achieved in the present invention by growing the mesh to extend beyond the channel, as shown in the figures, and then compressing the mesh into to the channel. This is possible in part due to the mesh configuration with its irregular extensions providing the structural elasticity to be compressible without compromising the integrity of the nanotubes themselves. In contrast, Noca does not teach compressing the fabricated nanotube array to achieve

good contact. Moreover, the vertically aligned configuration of the Noca nanotubes may jeopardize the integrity of the array if axially compressed with a cover.

Discussion of the Rejections Under 35 USC §103

The Examiner also rejected claim 18 and 19 under 35 USC §103(a) as being unpatentable over the Noca reference. In support of his rejection, the Examiner stated that the nubbins are redundant and unnecessary, stating that *"omission of an element and its function is obvious if the function of the element is not desires."* Contrary to this statement, however, the function of the nubbins is necessarily desired as a backup measure to prevent displacement of the mesh in the channel in case it broke off the substrate in a powerful flow stream. Unlike the Noca reference which is primarily concerned with electrophoretic sieves, the present invention is intended, for example, for use in pressure driven flow, where breakage is a realistic concern.

The Examiner also rejected claims 1-19, 45 and 46 under 35 USC §103(a) as being unpatentable over Dai in view of Noca. However, as stated before in Applicants' discussion regarding Noca , the aforementioned amendments to claims 1 and 45 make the Noca reference alone, or in combination with Dai no longer appropriate, as not all the elements of the claims are taught or suggested by both. With regard to claim 46, there is no teaching or suggestion to use pressure driven flow in either of the references, and is not inherent since the nanoscale of the structures are subject to different physical properties and therefore different limitations.

Summary

Applicant therefore respectfully submits that claims 1, 3-15, and 17-19 are in condition for allowance, and requests allowance of claims 1, 3-15, and 17-19. In the event that the Examiner finds any remaining impediment to the prompt allowance of these claims that could be clarified with a telephone conference, he is respectfully requested to initiate the same with the undersigned at (925) 422-7274.

Respectfully submitted,

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